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This paper deals with two experiments whose purposes are to investigate the linguistic competence of young children and their receptivity to adult speech. In the free response experiment, imperative sentences were presented to 1 1/2- to 2 1/2-year-olds. The sentences were minimal (a single noun), telegraphic, or full adult sentences. The youngest children were most responsive to minimal or telegraphic form, while the oldest responded to full sentences. The conclusion is that there is a period when language input and output is telegraphic and a slightly later stage when children understand full adult speech as input but when their output is still telegraphic. They tend not to listen to adult speech beginning with unfamiliar words. In the repitition experiment, grammatical and ungrammatical sentences were presented for immediate repetition to eighteen 3- and 4-year-olds. Responses contained errors in relation to the complexity of sentence structure and less accurate identification of ungrammatical sentences. The child corrects ungrammatical sentences in ratio to his familiarity with the structure. When he cannot identify a structure, he tends to give a simpler structure rather than a confused version of the difficult one. It is suggested as a result of the two experiments that children listen selectively to adult speech and that repetition is useful in investigating language competence. (DO)

Two Studies of the Syntactic Knowledge of Young Children[1]

presented at the Linguistics Colloquium, MIT, 1966

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[1]This paper is a preliminary report on studies of language acquisition conducted in collaboration with Elizabeth F. Shipley and Lila R. Gleitman; the work is supported by the National Institutes of Health, Grant #MH 07990.

I shall discuss here two experiments in which we investigated the linguistic competence of young children. We wanted primarily to find out how much of adult speech they understand, or attend to. We were interested, then, in the linguistic input for the children.

In recent years there has been much interest in problems of language acquisition. Unfortunately, work in this area has been based almost exclusively on the natural speech of children, that is, on their linguistic output. An explanation for this focus is that young children are unable or unwilling to make direct linguistic judgments or distinctions: attempts to get them to answer questions about language have been notoriously unsuccessful.

The emphasis on children's natural speech seems unfortunate for two reasons. The first is that linguistic performance does not necessarily reflect competence, as is well known. Historical accident and other non-linguistic factors determine performance to an important degree. The second reason has to do with the difference between what young children hear and what they say. With adults the two are similar, so that in accounting for output we can feel reasonably sure that we have accounted for input. Children, however, talk minimally -first in nouns and then so-called telegraph sentences - during their early years; while they hear full adult speech, addressed sometimes to themselves and sometimes to other adults. Therefore the question of passive competence, of comprehension as well as production, must be raised when one

considers the linguistic competence of young children. What do children make of what they hear? How much of adult speech do they in fact hear? are questions that should be asked.

We tried by indirect methods to attack these questions. Our notion was that experiments, in which children were presented with utterances of different structures, might yield information as to the linguistic distinctions and perceptions that the children operate with.

1

Free Response Experiment

The first experiment, which uses a free response technique, is discussed in detail in a forthcoming paper.[1] I shall summarize the experiment very briefly here, and then give a full description of a second study, which used the technique of repetition. The two experiments suggest, we think, a general approach to work with young children.

In the Free Response Experiment a group of imperative sentences was presented to children 1½ - 2½ years old. The imperatives all pertained to toys that were in the room, within easy reach, and the children were free to respond to (or to ignore) them. We recorded behavioral and verbal responses, when there were any, and examined the frequencies of the responses to see if they varied according to the differences between the imperatives.

We wanted to know whether the children noticed a difference between the types of imperatives. The experimental variables were structure and familiarity: the children heard three types of structures, minimal (single nouns), telegraph, and full adult sentences. The words in the experimental sentences - except for the toy names - were varied with nonsense syllables. This second type of variation was included to test how closely the children attended to the adult parts of adult speech. Our subjects' natural speech was minimal or telegraphic.

The children did, apparently, differentiate between the stimulus sentences. The structure variation produced interesting results: the youngest[2] children were most responsive to telegraph or minimal speech, while the older children were most responsive to full adult speech (recall that the oldest child is 2½). All the children responded less and somewhat differently to sentences containing nonsense. They were most likely to follow the command or to respond verbally when a sentence had only familiar words; to sentences with nonsense, the children tended to repeat part of the sentence.

We concluded from the pattern of their responses that the children did attend to adult parts of adult speech, but that they tend not to listen to adult speech beginning with unfamiliar words. To the extent that this is true, the adult speech that children actually hear at the stages of early grammar construction may be sharply limited. In fact, the linguistic environment of young children may not be quite so varied

and bewildering as people have tended to assume. For a full description of the experiment and discussion of the results, see the paper cited above.

We demonstrate that young children have a period where their language is telegraphic on the input as well as the output side (Roger Brown, Martin Braine, Susan Ervin and others have investigated the latter in some detail). We also show that at a slightly later stage the children are attuned to full adult speech as input, although their linguistic output is still telegraphic.

II

Repetition Experiment

I will now describe an experiment with 3 and 4 year old children, in which we used repetition as a means of investigating their linguistic competence. We presented the children with sentences of different types, some of which did and some of which did not occur in their natural speech. Our experimental question was, did the children respond differently to different structures? We tried, as in the Response Experiment, to infer from their responses something of what the children knew about the structures. The stimuli were all full sentences of adult speech; in the experiment

the children were asked to repeat the sentences immediately after an experimenter said them.

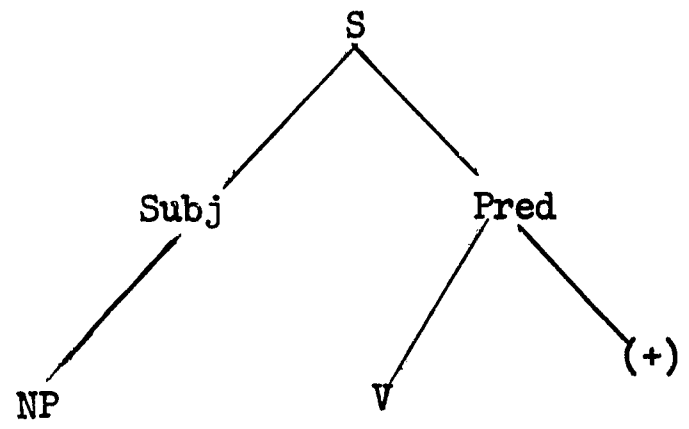
It is well known that people repeat more accurately when they can structure what they hear. We expected the children to be fairly accurat. in their repetitions of easier (for them) structures, much less accurate in their repetition of difficult structures. In analyzing the children's repetitions, we were interested in two main points: 1) what properties of a structure make it easy or difficult to repeat; and 2) what do children do - what kind of errors do they make - when they find it difficult to repeat a structure.

I will describe the experiment and then discuss its results.

The stimuli: The stimulus sentences varied in structure and grammaticalness. Children heard grammatical and ungrammatical versions of each structural type. We hoped that ungrammatical stimuli would bring out some of the passive knowledge we are most interested in. We expected the children to find it difficult to repeat ungrammatical stimuli, to the extent that they used structural cues in repeating grammatical stimuli.

There were 7 different structural types. They varied in complexity - that is, length of transformational history - but none were maximally simple.

The structures were alike in that each had, as its surface structure, the form of a simplex with one complex area.



The complex area might have a conjunction, an embedded sentence, an expanded determiner; otherwise the sentences contained subject, verb, object, in the normal order, with no other complexity. The structural types were these (labelled for convenience according to the type of complexity):

Number: Two of the marbles rolled away

Conjunction: Sam and Ronny built their house

Adjective: They played with long yellow blocks

VP: Daddy may have missed the train

Relative: The lady who sneezes is sick

Conj. Inversion: Not George but Danny came along

Complement: I want to play the piano

(Adjective and conjunction complexity occurred in both subject and object of stimulus sentences.)

There were ungrammatical sentences of each structural type. The ungrammatical stimuli contained a grammatical error, always in the complex part of the sentence. The errors had to do with either a constant, auxiliary, or inflection.

constant error: Harry likes ride the horses

auxiliary error: Harry likes to riding the horse

inflection error: Two of the marble rolled away

Length, counted in syllables, was held constant. We found in preliminary work that children of this age have little trouble with strings of words of 5 syllables or less, that is, they usually repeat them accurately; and that they are usually inaccurate in repeating strings more than 9 syllables long. Our stimuli were 6-8 syllables: it seemed likely that 3-4 year olds' ability to repeat strings of this length might depend to a great extent on their ability to structure the string.

Simple familiar words were used in each sentence. The children heard several instances, grammatical and ungrammatical, of each structure, but never the same sentence twice. The sentences were randomized and filler sentences inserted between ungrammatical stimuli, so that a child did not hear several ungrammatical stimuli in a row; there were 150 sentences in the stimulus list.

The experimental sessions were simple. They were conducted by an experimenter in the child's home, preferably with the mother absent (it wasn't always possible to manage this). The children were asked by the experimenter to "say what I say," and given practice with examples until they understood the task. (All the children learned with ease what was expected of them.) The children were allowed to rest when they showed signs of tiring, and were occasionally rewarded for cooperation with candy. Usually two ½ hour sessions were needed to present all the stimuli. The experimental sessions were taped, and transcribed by someone not present at them.

Our subjects were 18 children, 3 and 4 years old; all came from middle-class, professional backgrounds. We collected samples of their natural speech and ranked the children according to verbal maturity, using modal utterance length as a measure. The subjects fell into three groups when ranked in this way. Although there were exceptions, generally the older children were more advanced in linguistic development.

Scoring: The children's responses were scored as accurate, inaccurate, or inadequate. The first category is self-evident. Inaccurate responses were not completely accurate renditions of the stimulus sentence, but contained 3 words of stimulus, in the order in which the child heard them. Inadequate responses were attempted repetitions which did not meet the criterion for the inaccurate category, and trials when the child refused to respond at all. Occasionally the experimenter

was asked to say a stimulus sentence twice; these trials were excluded from the analysis, since we couldn't be sure whether the child had heard the stimulus the first time or not. I will mention later subgroupings of the responses that were scored as inaccurate.

Results

In discussing the results of the experiment, I will first outline the effects of the experimental variables on the children's repetitions; then I will speculate briefly as to some of the processes involved and what we can infer, from the children's inaccurate repetitions, of their knowledge of the stimulus sentences.

Structure

The children's responses were significantly affected by the structure variable.[3] Some of the structures were much easier for the children to repeat than others: the easier ones produced a relatively high percentage of accurate repetitions, the more difficult produced a much lower percentage of accurate repetitions. On the basis of percentage of accurate repetitions, the structures fell into two groups:

Easy	Difficult
(A structures)	(B structures)
Conjunction	Adjective
Number	Relative
Complement	Verbal Auxiliary
	Conjunction Inversion

The frequencies of other types of responses also differed for the two groups of structures: there were more inaccurate and inadequate responses to B stimuli than to A stimuli.

Inaccurate responses were defined as repetitions that contained at least three words of the stimulus sentence, in the order in which they occurred. The inaccurate responses were grouped according to the seriousness of the error they contained. Errors were scored as serious or peripheral; counted as peripheral errors were changes of article (e.g. the instead of a), changes of tense (e.g. past instead of present), changes of number e.g. plural instead of singular, close semantic substitution e.g. go instead of run).

Serious errors were much more frequent in responses to B stimuli than in responses to A stimuli.

Responses with serious errors were subdivided according to whether the errors were structure-preserving or structure-violating. I will give some examples of each type of serious error to make the categories clear.

Structure-preserving:

(stimulus) The old grey wolf chased rabbits
(response) The old wolf chased rabbits

(stimulus) The lady should have gone home
(response) The lady should gone home

(stimulus) The boy who was running fell down
(response) The boy running fell down

Structure-violating:

(stimulus) The old grey wolf chased rabbits
(response) The old grey chased rabbits

(stimulus) The boy who was running fell down
(response) The boy who was fell down

(stimulus) The boy who was running fell down
(response) The boy fell down

Note that when the complexity was omitted in a response, the response was scored as structure-violating.

Structure-violating responses were more frequent to B stimuli than to A stimuli. 3 out of the 18 subjects had structure-violating errors in repetitions of A stimuli; 15 of the 18 subjects had errors of this type in repetitions of B stimuli.

It is clear that A and B structures were different for our subjects: the A structures were relatively easy for them to repeat, the B structures were quite difficult. We now wish to characterize the two groups of structures, as at least a partial answer to the question, what makes a structure easy or difficult for children to repeat?

As we would expect, it is generally true that the more difficult structures are more complex, that is, they have longer transformational histories. Complexity in this sense does not constitute an adequate criterion, however: consider the Comp and Rel structures, both of which have two underlying sentences, one embedded to another.

A structure (Comp): Johnny wants to ride the horse.

B structure (Rel): The lady who sneezes is sick.

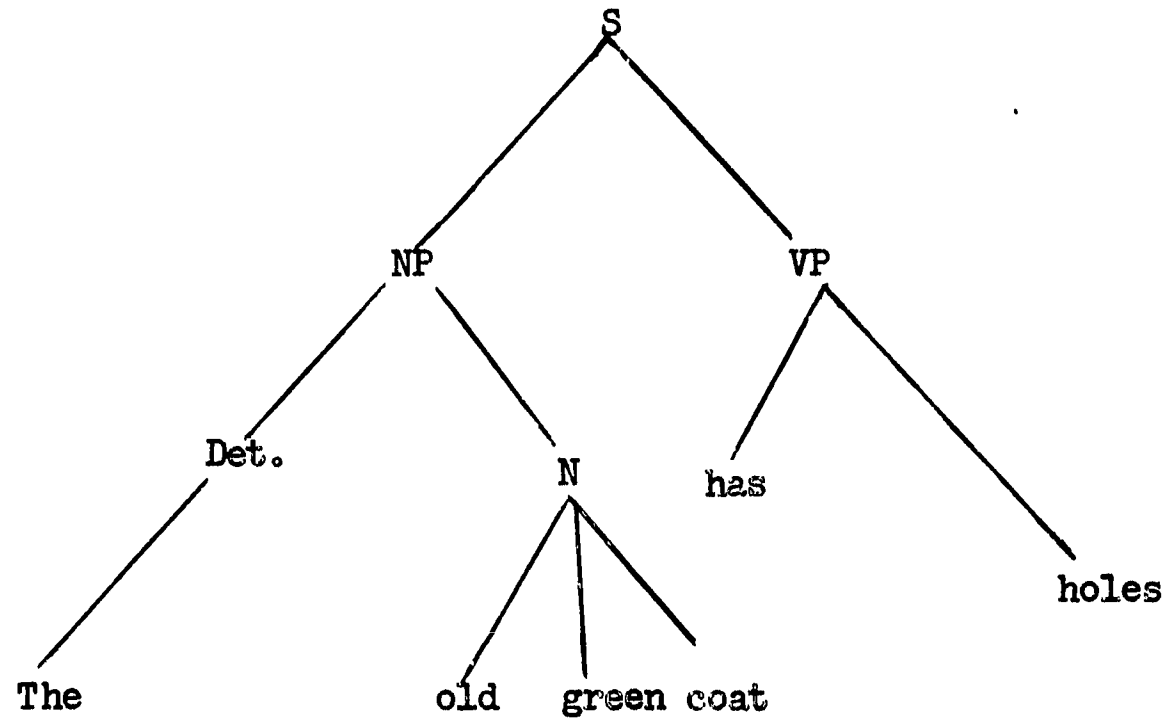
In the Comp sentence, a sentence is substituted for the object nounphrase; in the Rel sentence, a sentence is adjoined to a subject nounphrase, and interposed between the subject noun and the main verb of the sentence. It seems, then, that the way in which sentences are combined makes a difference, in other words that surface structure is more important than length of transformational history (at least for the children's performance of the task of repetition).

Why should surface structure be important? We have assumed that to repeat a sentence with reasonable accuracy, a child must be able to impose a structure on the sentence. There may be a difference in surface structures, in how accessible they are to structural analysis: that is, how easy they are to hear. Thus it is not surprising that Rel sentences, where a sentence is interposed between subject noun and verb, are hard to repeat - and perhaps hard to understand. However it is less obvious why Adj structures were hard for the children to repeat.

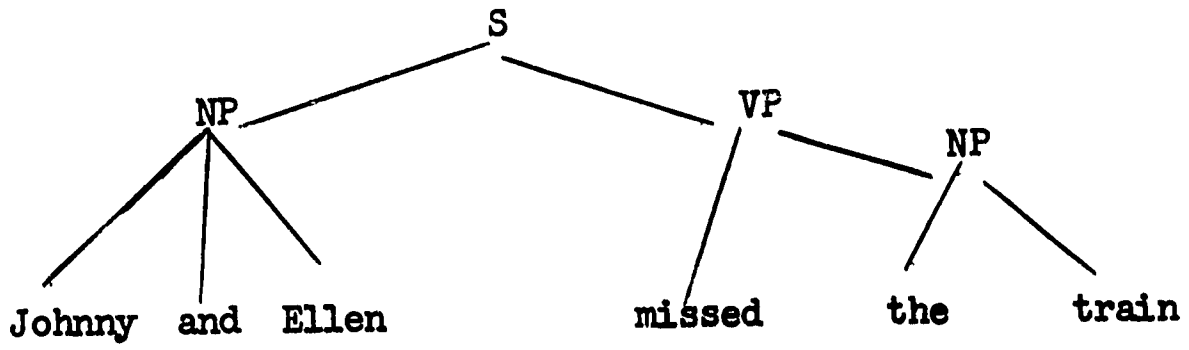
Location of complexity is one possible factor. Children might find more accessible structures with the complex area toward the end, as it was in the Comp sentences they were asked to repeat. We tested

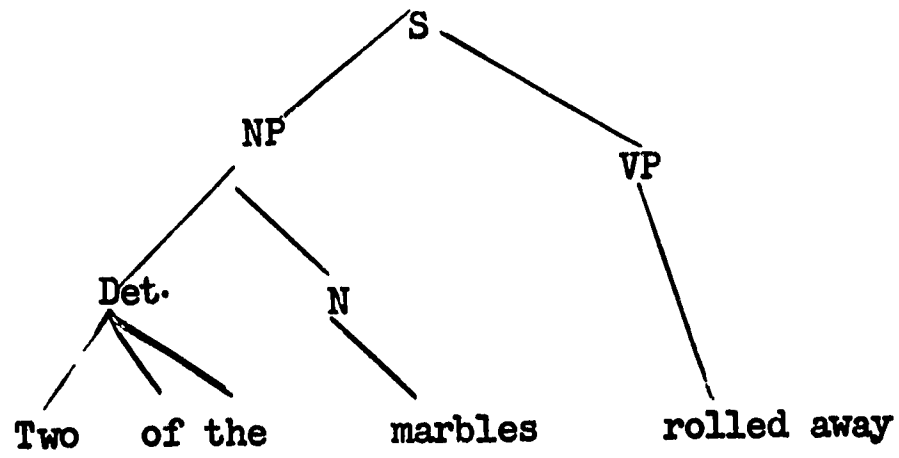
the results to see whether location of complexity made a difference, and found that it did not: accurate responses were equally likely to stimuli with complexity at the beginning or the end.

We differentiate between A and B surface structures in terms of a property I will call compression. Compression refers to the way semantic information occurs in a sentence. When sentences have low compression, semantic information is distributed fairly evenly throughout the sentence; when sentences have high compression, semantic information is bunched together, or compressed, at the nounphrase or verbphrase level. In terms of tree structure, highly compressed sentences have NP or VP nodes dominating several information-carrying elements:[4]



In sentences with low compression, NP or VP nodes dominate relatively few information-carrying elements





The A structures, which the children found easy to repeat, have relatively low compression; B structures, which were more difficult, have relatively high compression.

We measured latencies of the children's responses (time from the end of the stimulus to the beginning of the response), and found that in general, responses to B stimuli took longer than responses to A stimuli. This was especially true for the younger, less verbally mature, children; there was less difference between the latencies of responses to A and B stimuli for the more mature group. The differences in frequency of accurate repetitions, and in latencies, suggest that sentences with low compression may be easier to understand as well as to repeat. Perhaps the children's limited faculties are overburdened if too much information is compressed into one space.

The effect of compression suggests an hypothesis about children's acquisition of new structures. Degree of compression may be an important factor in the order in which children acquire new structures. Transformations resulting in surface structures of relatively low compression may be learned early, and transformations resulting in highly compressed surface structures may be learned later, as the memory span and grammatical and conceptual scope of the children increases. It would be interesting to investigate this possibility; however first the notion of compression must be refined and extended to cover different types of surface structures.

Ungrammaticalness

We now consider ungrammaticalness, the second experimental variable. Our interest is in the effect of the grammatical errors: in comparing the children's responses to grammatical and ungrammatical stimuli. If the children were repeating by rote there would be no reason for their accuracy to differ with grammatical and ungrammatical stimuli. However, if they used structural cues in repeating the grammatical errors might be disruptive, that is, the children might find it difficult to repeat ungrammatical stimuli.

Ungrammaticalness strongly affected all types of responses. As we expected, the children were less often accurate in their repetitions of ungrammatical stimuli. There were more serious errors in responses to ungrammatical stimuli, and more inadequate responses to ungrammatical than to grammatical stimuli.

	Accurate or peripheral error	Serious error	Inadequate response
Responses to A stimuli:			
Gram	92%	5.4%	2.6%
Ungram	60%	32%	8%
Responses to B stimuli:			
Gram	60%	26%	14%
Ungram	33%	36%	31%

Among the inaccurate responses - to ungrammatical stimuli - were a great number of structure-preserving responses, that were grammatical sentences: that is, grammatical versions of the ungrammatical stimuli.

To an ungram stimulus, Mary went see the animals the children might respond with the grammatical sentence, Mary went to see the animals. To a stimulus sentence Mine old green coat has holes, a child might respond, My old green coat has holes. These grammatical versions of ungrammatical stimuli will be referred to as normalizations.

There were more normalizing responses to the easier, A stimuli, than to B stimuli. If a child tended to repeat accurately grammatical stimuli of a given structure, he tended to normalize ungrammatical stimuli of that structure. In other words, when ungrammaticalness had a strong effect, there was a serious difference in the frequency of accurate responses to grammatical and ungrammatical stimuli - there were many normalizing responses to ungrammatical stimuli. But if ungrammaticalness had little effect there were few normalizing responses to ungrammatical stimuli. This relationship is expressed in our data by a significant correlation between the effect of ungrammaticalness and normalizations.

There was a possibility that other factors, besides the experimental variables of structure and ungrammaticalness, might have affected children's responses to the ungrammatical stimuli. The ungrammatical

stimuli differed in whether they had one or two possible normal structures: whether they were ambiguous of resolution. The stimuli also differed in the type of error they contained, from a mechanical point of view. We tested to see whether these factors contributed to or dominated the effect of ungrammaticalness.

Ambiguity of resolution: some of the ungrammatical sentences might be identified as having two different structures (with the addition, deletion of substitution of one element): For instance, there are two possible identifications of the following sentence:

1 Susie likes to riding in buses

1a Susie likes to ride in buses

1b Susie likes riding in buses

Some sentences, on the other hand, have only one identification, e.g.,

2 John wants to going to the zoo

2a John wants to go to the zoo

Responses might differ for stimuli that were unambiguous or ambiguous of resolution; either because of children's difficulty in deciding between two possible analyses, or because there would simply be more likelihood of a child's identifying a structure when there were two possibilities.

We compared responses to ambiguous and unambiguous stimuli, in terms of accuracy and normalizations. With one exception[5] the frequencies of both types of responses were not affected by ambiguity of

resolution. Apparently the children were not sophisticated enough to be aware of more than one possible identification, in most cases (their normalizations usually had only one of the two possible forms).

The grammatical errors, looked at from a mechanical point of view, involved several different operations (on a normal form): deletion, substitution, addition, of constants or endings. A particular kind of disruption might be easier to identify than another, or more difficult; and certain kinds of disruptions might be easy or difficult to reproduce. This is a mechanical rather than a grammatical difference, and we did not want to mistake one for the other. Ungrammatical stimuli were grouped, according to how they were formed from a grammatical sentence. Responses to these new categories showed that deletion of a constant had a different effect from the other operations: it depressed accuracy most, and produced the most normalizations, (that is, identification was easy but reproduction difficult with this particular type of error.)

The sentences containing errors also differed from a grammatical point of view: there were errors pertaining to constants, auxiliaries, or inflection. We tested to see whether the types of errors had different affects on accuracy (comparing responses to grammatical and ungrammatical stimuli) or on normalizations. Errors of inflected disrupted accuracy the most, errors of auxiliaries disrupted accuracy the least (these results were only near significance statistically). There

was no strong difference in the effect of the types of errors on normalizations.

This completes our discussion of the children's responses to the experimental variables.

I will now talk about normalizations and other responses from a different point of view. I shall try to outline the processes involved in producing successful and unsuccessful repetitions. Then an analysis of the children's unsuccessful repetitions will be presented and I will attempt further inferences about the children's knowledge of the structures of the experimental stimuli.

Normalizations.

We first ask, what happens when a child gives a normalizing response to an ungrammatical stimulus? The child hears a sentence with an error, and produces the sentence without the error. There are three possible explanations: the child hears and corrects the error, the child hears but does not reproduce the error, or finally, the child doesn't hear the error in the first place. The last two explanations are the most parsimonious and the most plausible: either the child does not hear or cannot reproduce the error - when he gives a grammatical response to an ungrammatical stimulus. We tried to establish whether

or not the children usually heard the grammatical errors.

We conclude that they heard the errors fairly often, from the effect of ungrammaticalness on all the types of responses. There were twice as many inadequate responses to ungram as to grammatical stimuli, and more serious errors (excluding normalizations). If the children usually did not hear the ungrammatical stimuli as ungrammatical, we would not expect these indications of disruption.

It seems probable that the children sometimes fail to hear the error, and sometimes fail to reproduce the error. The latency data is inconclusive, but suggest that both explanations hold. Some normalizing responses are as fast as accurate repetitions of grammatical stimuli - which we would expect if the children don't hear the error; some normalizing responses are longer, which we would expect if children heard the error but had trouble with it.

General Scheme for Repetition

Why should it be difficult for the children to accurately repeat ungrammatical sentences, when it is relatively easy for them to repeat grammatical sentences? Let us compare what is involved in repeating grammatical and ungrammatical sentences, in the light of a scheme of the repetition process.

Input → Storage → Output

(Identification) (Reproduction)

In terms of this familiar scheme, we can say that repeating a grammatical sentence involves three stages: first, the child must identify or analyze the sentence; second, he must store it; third, he must reproduce it.

With an ungrammatical sentence as stimulus, the child has a grammatical error as well as the sentence's normal structure to deal with. We can think of the error as a kind of footnote to the structure that increases the difficulty of repeating. At the stage of identification, the child must disentangle structure and footnote; he must store both, which is more cumbersome than the structure alone; he must reproduce both, which at the least involves an extra operation.

Successful repetitions of grammatical sentences reproduce a given structure, s; successful repetitions of ungrammatical reproduce structure and a footnote, s + f; normalizations reproduce just the structure, s; inadequate responses reproduce neither structure nor footnote.[6]

There is more stress on the faculties with ungrammatical stimuli, then. At the age of 3-4 children's faculties are still limited, so limited that they can repeat accurately grammatical sentences, but not ungrammatical sentences. Recall that it is just the most know structures - structures the children find easy to repeat in grammatical form - that with errors produce normalizations. We can now put it that the best-known structures are easiest to identify in ungrammatical form, which

is hardly surprising. But the children's faculties are often too limited for reproduction of the full ungrammatical sentence. This, I suggest, is the reason for the high incidence of normalizing responses; and the explanation of the correlation, mentioned earlier, between the effect of ungrammaticalness and normalizations.

This analysis covers only the times when the children hear the error in an ungrammatical stimulus. When they do not hear the error, of course, it is no more difficult to repeat ungrammatical than grammatical sentences; and it is not unreasonable that they are most likely not to hear an error when they expect a particular structure, that is, when they know a structure fairly well. In sum, then, the better known a structure, the more likelihood of its being heard as normal, (when it occurs in odd form).

If normalizations are due to the children's limited faculties, we would expect that normalizations would decrease if a) a particular structure were within their scope or b) the faculties increased in scope. We have in our data cases of each of these, suggesting that our explanation is a good one. Consider a) first. The children's faculties might be as adequate for repeating grammatical and ungrammatical versions of a structure, if the structure were very easy and very well-known, or on the other hand if structural cues were not used in the repetitions. In the first case there should be high accuracy

on responses to both kinds of stimuli, in the second case relatively low accuracy with both kinds. Although generally the various structural types of stimuli fell into two groups, A and B, there was one type at the extreme of each group. Conjunctions, such as We waved to Nick and Penny, were easier than the other A types; sentences with verbal auxiliaries, such as Johnny may have ridden to school were much more difficult than the other B types. There were few normalization responses to either of these types of sentences.

As faculties increase, we would expect more frequent accurate responses to ungrammatical sentences and correspondingly fewer normalizations. I mentioned earlier that our subjects fell into three groups when ranked on the basis of verbal maturity. The middle and most mature children had a higher percentage of accuracy, and more normalizations, than the least mature group. However there was a significant difference between the middle and the oldest group, with respect to ungrammaticalness: the oldest children were less affected by it than the middle ones. In other words, the percentage of accurate responses dropped most sharply with ungrammatical stimuli for the middle group; the older children were less disrupted by ungrammatical stimuli (although their responses too were significantly affected).

Interpretation of errors

The scheme for the repetition process enables us to interpret other errors in the children's responses, as well as normalizations. We suggest that different types of error indicate difficulty at different stages of the repeating process. We are interested in the children's difficulties in repeating A and B stimuli, so we shall look briefly at the errors and their incidence in responses to stimuli of each group.

Three types of error have been mentioned (excluding inadequate responses) peripheral errors, structure-preserving errors, and structure-violating errors. Normalizations are of course structure-preserving errors. Each type of error can be associated plausibly with difficulty at a different stage. Peripheral errors and normalizations, since they leave intact the basic structure of a stimulus, are probably due to difficulties at the stage of storage or reproducation. Structure-preserving errors that are not normalizations (e.g., omission of one of two adjectives) are probably due to storage difficulties.[7] It seems likely that structure-violating errors are due to difficulties at the first, identification stage of the repeating process; the alternative, that a child correctly analyzes a sentence but stores it according to a different analysis, or without the first one, is difficult to take seriously.

Inaccurate responses to A stimuli tend to have peripheral and/or structure preserving errors; inaccurate responses to B stimuli tend to have serious, structure-violating errors. Therefore we conclude that the children's difficulties with A stimuli occurred usually at the storage or reproduction stage of the repeating process; whereas frequently their difficulties with B stimuli occurred at the stage of identification. Not only were the responses to A stimuli more frequently accurate, then; we can say also that the children were more often able to correctly identify the A stimuli.

Now I want to speculate as to what happens when children have difficulty identifying a structure: What do the children hear? The inaccurate responses suggest that when children cannot identify a structure they tend to hear a simpler structure.

Our evidence is drawn from responses to B stimuli. Recall that there are several types of structure-violating error; one of these is the omission of the entire complexity of the stimulus sentence, so that it is repeated as a simplex sentence. There were twice as many instances of this type, where the complex aspect of a sentence is omitted, as other types of structure-violating errors together. If the children did not successfully identify a structure, they tended to ignore the complex aspects of that structure. This is particularly striking if one considers other types of serious errors that the children might

have made: they did not leave out the complex constituent altogether; nor, successfully repeating the complex constituent, forget the rest of the sentence; nor did they often make unorderly errors, garbling or ignoring crucial words. Instead, they tended to pick out simple structures from the complex structures.

Examples: 1) Mommy could have lost her purse.

Mommy lost her purse.

2) Not Jane but Betty called you.

Betty called you.

3) The boy who was running fell down.

The boy fell down.

Generalizing, we could say that children tend to omit, perhaps not to hear, what they don't know. This seems paradoxical: aren't we implying that the children must first analyze a structure, to find out what it is they don't know? The paradox is only apparent: we are discussing a mechanism rather than a procedure for analysis. In listening, the children pick out or attend to what they know, with the result that they eliminate or ignore what they do not know. Their behavior is not unlike that of the children in the Response Experiment outlined earlier, who tended not to listen to utterances beginning with words they did not know. Responses of this type, where the complex aspect of a sentence was entirely omitted, occurred rarely with A stimuli.

Finally, I would like to mention a different type of inaccurate response, that occurred occasionally with A stimuli and almost never with B stimuli. Some responses to A stimuli had structures similar to that of the stimulus, so similar that the response might be called approximation of the stimuli structure. For instance,

The man asked hear music ---> The man asked where's music

The man asked hear music ---> The man asked for more music

Both of the responses have, like the stimulus sentence, sentence objects: but the objects are quite different from that of the stimulus.

These approximations were only occasional,[8] but they suggest as other responses to A stimuli do, that the children had much better control of A structures than they had of B structures. In response to A structures, the children tended to repeat accurately, identify ungrammatical structures easily, and there were some approximations of the A structures. The contrast with B structures is strong: the children tended, with B structures, to give inaccurate or inadequate responses as frequently as accurate ones and to have trouble identifying the B structures.

We should not infer too readily that the children understand structures they can repeat. However, the different types of responses to our experimental stimuli suggest at least that the children know more about A structures than they do about B structures.

Summary

The experiment shows that repetition can be a useful tool for investigating linguistic competence. We found that 3 and 4 year old children could repeat quite accurately sentences with a low degree of compression (A structures), but that they were much less accurate in repeating sentences with higher compression (B structures). There was evidence that structural cues were used sometimes in repetitions of all the types presented; but the children's responses indicated that they knew a great deal more about the A structures than the B structures.

From their responses to structures that were difficult for them (at a particular stage), we were able to infer something of what children listen to in adult speech. In the Response Experiment sketched at the beginning of this paper[9] the children tended not to respond to stimuli containing nonsense syllables - that is, unfamiliar words. Their responses were especially rare to stimuli that began with unfamiliar words. Apparently the children "tuned out" utterances that signalled themselves at the beginning as impenetrable. In the repetition experiment the children were older and the structures more complex. It was striking that, when the children failed to repeat accurately a difficult

structure, they tended to give a simpler structure rather than a confused or garbled version of the difficult one. In both experiments, then, it seemed that the children listened to adult speech very selectively.

FOOTNOTES

1. Children's free responses to verbal commands by Elizabeth Shipley, Carlota Smith and Lila Gleitman, in preparation.

2. The subjects' ages varied from 1½ to 2½ years. We collected samples of their natural speech and ranked the subjects according to verbal maturity. Modal utterance length proved to be the most informative measure. The younger children tended to be the least advanced verbally.

3. In this presentation I shall mention results as significant, or different, with only rough statistical support. However, everything referred to in this way has been shown to be significant by statistical analysis.

4. This is only a rough description, applying to the types of stimuli our subjects heard. Actually a full investigation of this property - which we hope to embark on in the future - would show it to be more complicated.

5. Accurate repetitions were fewer for certain sentences with several verbal auxiliaries; namely those that had two possible resolutions, one of which involved deletion of one auxiliary, the other substitution. (E.g., Mommy could has lost her purse
   --→ Mommy could have lost her purse
   --→ Mommy has lost her purse)

There were relatively many normalizing responses to these stimuli, the normalizations including both possible resolutions.

5. Responses containing f alone - the complex phrase with error- did not occur.

7. Structure-preserving errors might be sometimes due to difficulties at the stage of production, or perhaps even of identification.

8. There were too few approximations for statistical analysis.

9. See footnote 1.